

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Implementation of Commercial)	
Advertisement Loudness)	MB docket No. 11-93
Mitigation (CALM) Act)	
)	

To: The Commission

COMMENTS OF HARRIS CORPORATION AND DTS, INC.

Harris Corporation (“Harris”) and DTS, Inc. (“DTS”) (hereinafter “Joint Commenters”) respectfully submit this Comment in response to the Federal Communications Commission’s (“Commission”) *Notice of Proposed Rulemaking* (“NPRM”)¹ seeking comment on proposed rules implementing the requirements of Commercial Advertisement Loudness Mitigation (“CALM”) Act. Harris, utilizing DTS real time loudness control technology and file-based (non-real time) loudness control, has developed a line of equipment that can control perceived commercial loudness across the workflow of both broadcasters and multichannel video programming distributors (“MVPDs”). The Joint Commenters have filed in this proceeding to provide the Commission with a background of their technology and discuss how broadcasters and MVPDs can demonstrate compliance under the “safe harbor” provision of Section 2(c) of the CALM Act² or through means other than the safe harbor provision. Any demonstration of compliance, be it through the safe harbor provision or other means adopted by the Commission, will require the implementation of equipment by broadcasters and MVPDs that can monitor, log

¹ In the Matter of Implementation of the Commercial Advertisement Loudness Mitigation (CALM) Act, Notice of Proposed Rulemaking, MB Docket No. 11-93, FCC 11-84 (rel. May 27, 2011).

² 47 U.S.C. § 621 (2010).

and adjust the loudness of commercials to be within the loudness range set forth by the ATSC A/85 RP. A compliance approach that solely relies on an indemnification clause in a contract will fail to address the true intent of the CALM Act, to prevent excessively loud commercials. Any alternative method of compliance must be used in association with a monitoring, logging, and real time loudness control device that can demonstrate compliance in the event of a consumer complaint and ideally prevent complaints by adjusting the loudness to the requirements set forth by the ATSC A/85 RP.

I. Harris and DTS Are Industry Leaders In Audio Loudness Correction.

Harris is an international communications and information technology company serving government and commercial markets in more than 150 countries. Harris Broadcast Communications, a business unit within Harris, is headquartered in Denver, Colorado, and operates the world's largest transmitter manufacturing factory in Quincy, Illinois. Harris Broadcast Communications also maintains research centers in Mason, Ohio, Vista, California, Northridge, California, Bridgewater, New Jersey, and Pottstown, Pennsylvania. As the world's leading broadcast equipment supplier, Harris is the leader in digital solutions for television and radio broadcasting. Harris is committed to facilitating technological advancement within the media industry and focused on helping both broadcast and MVPD customers succeed in the business of digital media. Harris Broadcast Communications is an active member of industry and standard setting organizations including the Advanced Television Systems Committee ("ATSC").

Founded in 1993, DTS' corporate headquarters is located in Calabasas, California, with its licensing operations headquartered in Limerick, Ireland. DTS also has offices in Northern California, Washington, China, France, Hong Kong, Japan, Singapore, South Korea, Taiwan, and

the United Kingdom. DTS is dedicated to making digital entertainment exciting, engaging and effortless by providing state-of-the-art audio technology to hundreds of millions of DTS-licensed consumer electronics products worldwide. DTS is a member of the ATSC and an active in many industry and standards setting organizations. DTS technology is used in broadcast, digital media delivery, home theaters, car audio systems, PCs, game consoles, DVD players, televisions, digital media players, set-top boxes, smartphones, surround music software, and every device capable of playing Blu-ray discs.

Harris and DTS have been partners since 2003 and have been supplying real time loudness correction technologies worldwide since 2008.³ Appendix A illustrates the various stages of the audio content supply chain where loudness control can be applied. The closer to the end transmission point equipment is utilized, the more likely that commercial audio content will be aired in compliance with the CALM Act. Therefore, to most accurately control the loudness of commercial audio content, equipment is best utilized either remotely at source of the transmission (*i.e.*, a live location) or within a broadcast or MVPD facility.

At the production stage commercial advertisers could use equipment to control loudness and meet the ATSC A/85 RP before even passing content along to broadcasters or MVPDs. The Harris QuiC media analysis server is a fully automated, file-based test and measurement server platform that verifies the quality of compressed video, uncompressed audio and selected formats of compressed audio content residing on servers and storage networks — before content is distributed. QuiC analyzes up to five mapped channels of audio at once for loudness (per ITU-R BS.1770), providing short-term loudness, consistency measurements and an overall “center of gravity” (average loudness over the entire run of a clip). Using optional file correction tools,

³ For additional information on Harris/DTS technology visit:
http://www.dts.com/Professionals/Products/UpMixing_Downmixing_Loudness_Control/Harris/Overview.aspx

coupled with the results of the loudness analysis pass, QuiC can then adjust uncompressed audio to a desired loudness level without compromising dynamic range. However, relying on loudness control equipment solely at the production stage may not be the best way to ensure that broadcasters and MVPDs ultimately prevent the transmission of non-compliant audio content.

When material is transmitted from a live location, cable headend or broadcast transmission facility, content providers must quickly manage perceived loudness levels to a specific desired dialogue normalization. At the heart of all Harris loudness correction equipment⁴ is DTS Neural Loudness Control (“NLC”) — a real-time loudness correction system which utilizes the ITU-R BS1770 loudness measure.⁵ NLC measures and applies correction to content that falls outside a desired loudness range. By employing an algorithm that limits the amount of correction to only that which is needed to maintain a targeted level, NLC is able to deliver a natural sounding result, often transparent of any audio modifications. DTS NLC has been integrated into Harris’ 6800+™ core processing platform,⁶ the X85™/75™ multiple-application video/audio platforms,⁷ the Selenio™ media convergence platform,⁸ and the NEO®

⁴ For additional information on the Harris family of advanced audio solutions visit:
<http://www.broadcast.harris.com/solutions/advancedAudioOptions/default.asp>.

⁵ For additional information DTS Neural Loudness Control visit:
http://www.dts.com/Professionals/Technologies/Processing/DTS_Neural_Loudness_Control/Overview.aspx.

⁶ The 6800+ Core Processing Platform includes the APM6801+ and APM6803+. The APM6801+ offers eight discrete AES inputs and outputs and DTS Neural Loudness Control. The APM6803+ multichannel audio processing station is a fully integrated loudness and surround sound processor. Features include SDI and discrete AES interfaces, full audio/video frame sync, automatic audio delay tracking for guaranteed lip sync, automation and manual control of loudness profiles, loudness and surround field protection, and DTS Neural Loudness Control.

⁷ The X85/X75 Multiple-Application Video and Audio Platforms includes the 1RU X85 multiple-application video and audio platform and 1RU X75 platform. The 1RU X85 platform offers an optional plug-in capability to support DTS Neural Loudness Control. The 1RU X75 platform can add support for DTS Neural Loudness Control.

⁸ The Selenio Media Convergence Platform is an industry-first modular platform combining traditional baseband video/audio processing, compression and IP networking. The Selenio also offers the ability to add DTS Neural Loudness Control.

format conversion products.⁹ All Harris real time control products utilizing DTS NLC software feature the ability to interface to Dolby® encoded audio, as well as the ability to implement DTS Neural, surround sound management tools.

Harris also has a complete catalog of devices that are capable of monitoring and logging loudness throughout the broadcast supply chain. For example, Harris' CMN-LA loudness analyzer¹⁰ and LLM-1770 loudness logger and monitor¹¹ provides a variety of metering, metadata readout, alarming, and data logging about the audio content under analysis. Loudness and true peak measurements are made to the ITU-R BS.1770 standard with five times oversampling. Regardless of the audio codec used or method by which commercials are inserted into a video stream broadcasters and MVPDs can purchase and place equipment in their facility that monitors and logs loudness in accordance with ATSC A/85 RP. Harris monitoring and logging equipment can be used in conjunction with Harris-DTS loudness control equipment to provide broadcasters and MVPD's with the complete solution for complying with the ATSC A/85 RP and demonstrating compliance with Commission regulations.

II. Alternative Methods of Compliance Under the CALM Act, Beyond the Safe Harbor Provision, Should Be Permitted, But Reevaluated Over Time.

The Joint Commenters agree with the Commission that under the CALM Act broadcasters and MVPDs should be permitted to engage in alternative methods of demonstrating

⁹ NEO-based XHD-3903 format converter offers an optional plug-in capability to support DTS Neural Loudness Control. The XHD-3903 module can add support for DTS Neural Loudness Control with a field upgrade.

¹⁰ The CMN-LA provide metering of up to 16 channels simultaneously making for rapid alignment checks. The CMN-LA also incorporates a radar display, which shows loudness on a short-term meter, a graph covering periods from one minute to 24 hours, and numeric display of average loudness and consistency (loudness range).

¹¹ The LLM-1770 allows for a surround and a stereo program to be logged simultaneously. The LLM-1770 also has four AES inputs, with an option for SDI embedded from SD, HD or 3 Gb/s sources.

compliance beyond the process laid out under the safe harbor provision.¹² However, a means of compliance that relies solely on a contractual approach of indemnification could undermine the intent of the CALM Act.¹³ While a contractual approach to compliance could help ensure that the audio content being provided to broadcasters and MVPDs is already compliant with the ATSC A/85 RP, providing peace of mind, broadcasters and MVPDs are still ultimately the regulated entities under the CALM Act, not advertisers or other content distributors. The Commission itself recognizes in the *NPRM* that broadcasters or MVPDs, whoever is the final arbiter of the audio content, is the entity responsible for ensuring the requirements of the CALM Act are met.¹⁴ A contractual approach by itself would be insufficient to meet the intent of the CALM Act, to control the loudness of commercials. The Joint Commenters are concerned that creating a compliance system that relies on indemnification clauses will result in confusion within the industry as to who is in fact the regulated entity, fail to actually prevent non-complying audio from being transmitted, and ultimately not fix the issue the CALM Act was passed to address, controlling the excessive loudness of televised commercial content.

The most effective way to ensure compliance with the CALM Act is to install equipment within the broadcast, MVPD, or remote facility that can monitor, log, and modify non-complying audio content. Even if the audio data is not intentionally modified by a broadcaster or MVPD

¹² “While stations/MVPDs shall be deemed in compliance if they show that they have installed utilized and maintained equipment in a commercial reasonable manner pursuant to Section 2(C) we do not believe that the CALM Act limits entities to just this one means of demonstrating compliance.” *CALM NPRM*, *supra* note 1, at ¶ 22.

¹³ “With the passage of this legislation, we will end the practice of consumers being subjected to advertisements that are ridiculously loud, and we can protect people from needlessly loud noise spikes that can actually harm their hearing. This technical fix is long overdue, and under the CALM Act, as amended by the Senate, consumers will be in the driver’s seat.” Statement of Rep. Eshoo, House Floor Consideration of S. 2847, 156 Cong. Rec. HR 7720 (daily ed. Nov. 30, 2010).

¹⁴ “The station/MVPD would remain responsible for noncompliance with the regulations required by the CALM Act when the program source fails to deliver content in compliance with the ATSC A/85 RP, the station/MVPD transmits the nonconforming content to viewers, and the content is the subject of consumer complaints.” *CALM NPRM*, *supra* note 12, at ¶ 24.

between the time in which they receive and transmit audio content, metadata can still be unintentionally corrupted. If corrupted audio content is allowed through the supply chain, regardless of if there are any contractual indemnification clauses, viewers will still be subjected to the problem the CALM Act was enacted to prevent, excessively loud commercials.

While alternative methods of compliance beyond the safe harbor provision may help address the concerns raised by MVPDs regarding compliance in the short term,¹⁵ control and monitoring equipment will still be needed to substantiate and provide evidence of compliance in the event of a consumer complaint. In the long term, addressing concerns raised by MVPDs regarding the use of non-AC-3 codec is easily resolved by amending ATSC A/85 RP in two ways. First the ATSC could create a “Transmission Systems without Metadata” section as part of ATSC A/85 RP. The basis of this section would direct the broadcaster to create the same consistency of loudness found in the consumer domain, post-dialnorm offsets, just ahead of the metadata-less transmission method (transcode). Second, the ATSC could revise all references to the AC-3 codec, instead to address “codecs which support Metadata parameters such as dialnorm” (AC-3, Dolby Pulse, DTS Digital Surround, DTS Express, *etc.*).

Although the Joint Commenters support the establishment of alternative means of compliance with the CALM Act in the near term, the Commission should nonetheless state a preference for broadcasters and MVPDs to comply with the CALM Act under the safe harbor provision. Encouraging broadcasters and MVPDs to install equipment that can monitor, log, and adjust loudness will help ensure that the commercial loudness is uniformly monitored and controlled, as intended by the CALM Act. As the ATSC A/85 RP evolves the Commission should periodically reevaluate whether an alternate means of compliance is still necessary based

¹⁵ See *Id.* at ¶¶ 27-32 (discussing unique audio challenges faced by MVPDs including block content, non-AC-3 formats, and broadcast retransmission).

on the modifications to ATSC A/85 RP, technology at hand, and overall compliance by entities employing methods outside of the safe harbor provision.

III. Demonstrating Compliance with the Safe Harbor Provision of the CALM Act Should Be Implemented in a Manner that is Minimally Burdensome on Equipment Manufacturers, Broadcasters, and MVPDs.

The safe harbor provision designates that a regulated entity may be found in compliance with Commission's rules implementing the CALM Act if the regulated entity demonstrates, in a commercially reasonable manner, the (1) installation, (2) utilization, and (3) maintenance of equipment and associated software that complies with the requirements of the ATSC A/85 RP. Compliance with the safe harbor provision should be established in a manner that is minimally burdensome on equipment manufacturers, broadcasters, and MVPDs. The safe harbor provision should provide regulated entities a uniform and easily achievable means for achieving compliance with the CALM Act.¹⁶ The more burdens that are placed on the regulated entities or the suppliers of loudness equipment, the longer compliance will take and the more costly solutions will become. Furthermore, the Commission should define the term 'commercially reasonable' in a technologically neutral manner. The definition of 'commercially reasonable' should permit broadcasters and MVPDs to choose the equipment of their choice based on the individual circumstances of the regulated entity. An evaluation of "commercially reasonable" should not be based on one single dominant technology, but inclusive of innovative loudness control technology.

A. Installation

To ensure that loudness mitigation and monitoring equipment conforms to the ITU-R BS.1770, the Joint Commenters recommend that equipment manufacturers note on the product

¹⁶ Statement of Rep. Terry, *House Floor Debate of S. 284, supra note 13*, at H7720 (describing Section 2© of the CALM Act as "a kind of 'safe harbor' by deeming an operator that installs, utilizes and maintains the appropriate equipment and software in compliance with the [CALM Act]").

website and within the product manual that the equipment conforms to ATSC A/85 RP and ITU-R BS. 1770. Such a labeling requirement would prevent undue administrative and testing burdens on manufacturers, broadcasters and MVPDs. If the installed equipment includes the appropriate labeling on the website and in the manual the Commission should find the installation prong of the safe harbor test to have been met.

The Joint Commenters urge the Commission not to implement a labeling requirement directly on equipment. There are numerous loudness standards used throughout the world and an equipment labeling requirement could increase manufacturing costs by impacting the economies of scale that result from mass production of equipment, namely the chassis. Furthermore, requiring a label directly on equipment could cause confusion within the international market about whether the equipment complies with other global loudness standards. Notations on equipment manufacturers' product websites and within product manuals are a minimally burdensome way to provide broadcasters and MVPDs with assurance that the equipment they are purchasing complies with the ATSC A/85 RP and ITU R BS. 1770.

B. Utilization.

To demonstrate utilization the Commission could require that a log be produced by the regulated entity in the event of an enforcement proceeding. The Harris CMN-LA and LLM-1770 monitoring equipment internally logs the loudness data 10 times a second. This time stamped data is stored for up to five days and can easily be copied to a USB thumb drive or exported via web page to external storage. A summary of the loudness information and dialnorm setting is created on each reset, or after 24 hours of continuous operation. This can be tied in to the broadcast automation system to receive a trigger at the start of each event and report back the loudness data for the previous event. This information can then be made part of the as-run log

from the automation that is used to reconcile the broadcast schedule. Being able to produce such a log should be sufficient to demonstrate utilization under the safe harbor provision.

C. Maintenance.

There are freely available test signals that broadcasters and MVPDs can use to check and demonstrate that equipment is functioning properly. The ATSC A/85 RP has a link to a speech sample that is recorded with a loudness of -24 LKFS.¹⁷ The European Broadcasting Union has also published a suite of test clips to verify proper operation of measuring devices.¹⁸ The ITU is also looking into assembling a set of test clips to test compliance with ITU-R BS.1770. Tests can be time stamped, transferred to a USB or external storage, and recalled to show when a test was last successfully performed. Timeframes for such tests should be based on the input provided by broadcasters and MVPDs in this proceeding. Replacement and repair time can vary depending on the issue. Should equipment need to be fixed or replaced the appropriate timeline for such activity should be based on the individual circumstances of the problem at hand.

IV. Conclusion.

The Joint Commenters respectfully submit this Comment for the Commission's consideration. While alternative means of compliance outside the safe harbor provision may be appropriate at this time, the Commission should reserve the right to revisit the necessity of such alternative compliance methods. Compliance under the safe harbor provision of the CALM Act should be the Commission's preferred method of compliance to encourage uniformity. The Joint Commenters look forward to working with the Commission on establishing regulations to implement the provisions of the CALM Act.

¹⁷ ATSC A/85 RP speech sample available at: http://www.atsc.org/refs/a85/Speech_sample.wav .

¹⁸ European Broadcasting Union suite of test clips available at: <http://tech.ebu.ch/webdav/site/tech/shared/testmaterial/ebu-loudness-test-setv01.zip>.

Respectfully submitted,

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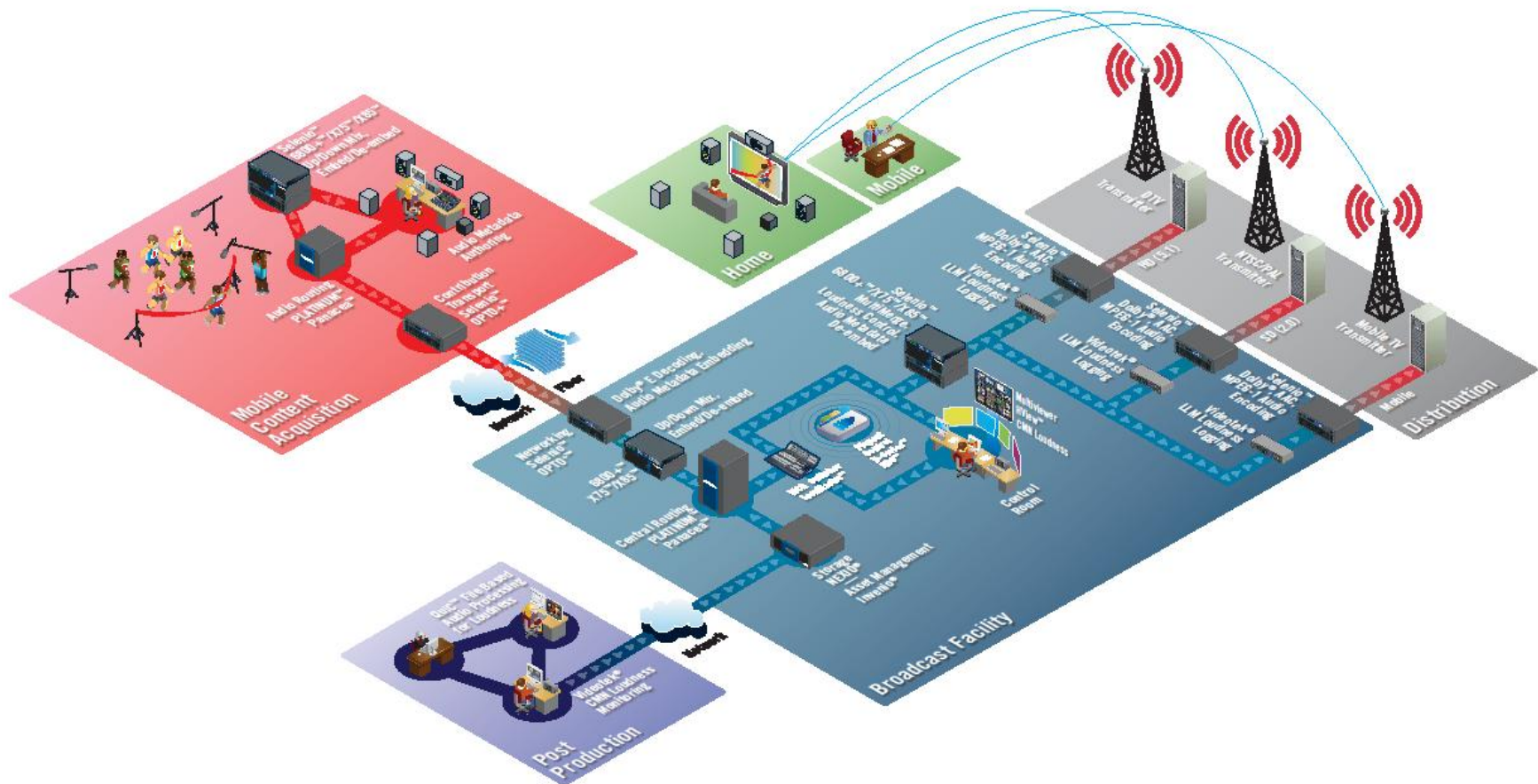
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APPENDIX A

Loudness Workflow Solutions



The Loudness Control, Monitoring and Logging Workflow Diagram above is available at:
http://www.broadcast.harris.com/media/3DTVWorkflow_25-16049.pdf.